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Filed January 5, 2004
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Listing of Claims

After entering the present amendment, claims 26-46 are currently pending in the present patent application. Please cancel claims 1-25 without prejudice.

1.-25. (cancelled)

26. (new) A fastening system for securing a plurality of workpieces together in a fastened joint in a plurality of applications having different load requirements, the fastening system comprising:

a first pin and a second pin;

each of the pins having an elongated shank and terminating at one end in an enlarged head and at its opposite end in a grooved portion comprising a plurality of circumferentially extending lock grooves and crests, the lock groove and crest geometry of the pins engaging a first collar or a second collar to fasten together the workpieces in the plurality of applications having different load requirements wherein the lock grooves of the first pin are of the longest width required for the first collar of lower strength in a shear application and the lock grooves of the second pin are of the longest width required for the second collar of greater strength in a tension application, and the crests of the pins are of the longest width required for the second collar of greater strength in the tension application, wherein the first collar and the second collar are of different strengths and different materials and the lock groove width for the second pin differs from the lock groove width for the first pin by no more than 10%, wherein the applications are selected from the group consisting of shear, shear/tension, tension, shear composite, shear/tension composite and tension composite applications.

27. (new) The pin of claim 26 wherein the first collar has a shear strength of about 64% of the shear strength of the second collar.

28. (new) The pin of claim 26 wherein the first collar is made of an aluminum alloy and the second collar is made of a titanium alloy.

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29. (new) The pin of claim 26 wherein the lock grooves are overpacked in the range of 17% to 25%.

30. (new) The pin of claim 26 wherein the workpieces are made of metal, composites or combinations thereof.

31. (new) The pin of claim 26 wherein the collars have about the same outside diameter and are swaged into the lock grooves of the pin with an installation tool having a swage anvil with a uniform swage cavity.

32. (new) The pin of claim 26 wherein the pin fastens workpieces that vary in thickness up to 1/8 of an inch.

33. (new) A fastening system for securing a plurality of workpieces together in a fastened joint in three or more applications having different load requirements, the fastening system comprising:

a first pin and a second pin;

each of the pins having an elongated shank and terminating at one end in an enlarged head and at its opposite end in a grooved portion comprising a plurality of circumferentially extending lock grooves and crests, the lock groove and crest geometry of the pins engaging a first collar or a second collar to fasten together the workpieces in three or more applications having different load requirements wherein the lock grooves of the first pin are of the longest width required for the first collar of lower strength in a shear application and the lock grooves of the second pin are of the longest width required for the second collar of greater strength in a tension application, and the crests of the pins are of the longest width required for the second collar of greater strength in the tension application, wherein the first collar and the second collar are of different strengths and different materials, wherein the applications are selected from the group consisting of shear, shear/tension, tension, shear composite, shear/tension composite and tension composite applications, and wherein the lock grooves are

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defined by a root radius extending from a lowermost portion of the lockgrooves vertically and the lock groove width extends horizontally across the lockgrooves with the root radius equal to the lock groove width.

34. (new) The pin of claim 33 wherein the first collar has a shear strength of about 64% of the shear strength of the second collar.

35. (new) The pin of claim 33 wherein the first collar is made of an aluminum alloy and the second collar is made of a titanium alloy.

36. (new) The pin of claim 33 wherein the lock grooves are overpacked in the range of 17% to 25%.

37. (new) The pin of claim 33 wherein the workpieces are made of metal, composites or combinations thereof.

38. (new) The pin of claim 33 wherein the collars have about the same outside diameter and are swaged into the lock grooves of the pin with an installation tool having a swage anvil with a uniform swage cavity.

39. (new) The pin of claim 33 wherein the pin fastens workpieces that vary in thickness up to 1/8 of an inch.

40. (new) A fastening system for securing a plurality of workpieces together in a fastened joint in a plurality of applications having different load requirements, the fastening system comprising:

a first pin and a second pin;

each of the pins having an elongated shank and terminating at one end in an enlarged head and at its opposite end in a grooved portion comprising a plurality of circumferentially extending lock grooves and crests, the lock groove and crest geometry of the

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pins engaging a first collar or a second collar to fasten together the workpieces in the plurality of applications having different load requirements wherein the lock grooves of the pins are of the longest width required for the first collar of lower strength in a shear application, and the crests of the pins are of the longest width required for the second collar of greater strength in a tension application, wherein the first collar and the second collar are of different strengths and different materials, wherein the applications are selected from the group consisting of shear, shear/tension, tension, shear composite, shear/tension composite and tension composite applications.

41. (new) The pin of claim 40 wherein the first collar has a shear strength of about 64% of the shear strength of the second collar.

42. (new) The pin of claim 40 wherein the first collar is made of an aluminum alloy and the second collar is made of a titanium alloy.

43. (new) The pin of claim 40 wherein the lock grooves are overpacked in the range of 17% to 25%.

44. (new) The pin of claim 40 wherein the workpieces are made of metal, composites or combinations thereof.

45. (new) The pin of claim 40 wherein the collars have about the same outside diameter and swaged into the lock grooves of the pin with an installation tool having a swage anvil with a uniform swage cavity.

46. (new) The pin of claim 40 wherein the pin fastens workpieces that vary in thickness up to 1/8 of an inch.